Munich Cancer Registry

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ICD-10 C91: Lymphoid leukaemia

Incidence and Mortality

Year of diagnosis	1998-2016
Patients	4,555
Diseases	4,563
Creation date	08/21/2018
Export date	08/09/2018
Population	4.81 m

Munich Cancer Registry
Cancer Registry Bavaria - Upper Bavaria Regional Center
at Klinikum Grosshadern/IBE
Marchioninistr. 15
Munich, 81377
Germany

https://www.tumorregister-muenchen.de/en

https://www.tumorregister-muenchen.de/en/facts/base/bC91__E-ICD-10-C91-Lymphoid-leukaemia-incidence-and-mortality.pdf

Index of figures and tables

Global Statements about the statistics on the Internet –
Baseline Statistics (grey button), **Survival** (red button)

In these analyses, the clinics and physicians of Upper Bavaria and the city and county of Landshut[#], with a total of 4.69 million inhabitants, account for the frequency of cancer diseases[##] and the achieved long term results. Additionally, the long term survival evaluated by the Munich Cancer Registry (MCR) is compared with the results of the population-based registry in the USA (SEER), which is useful for checking the consistency of the data on an international level.

In comparing several tables, inconsistent figures may be detected. This is based on the fact that different patient cohorts are included in the base calculation, for example when proportions of multiple tumors or DCO-cases[###] are concerned. In other cases the individual tumor diagnosis is the basis for calculation, for example with incidence.

The foot notes describe the currentness of the data. The baseline statistics and survival data are updated annually. This yearly analysis comprises the Annual Report of the MCR.

Clinics and physicians have access to essentially more detailed data, with which they can check, compare and in the best case optimize their own data and results.

We would be pleased to receive corrections, critique and useful suggestions. Just send an e-mail to tumor@ibe.med.uni-muenchen.de.

Munich Cancer Registry, August 2018

[#] Base data has been collected since 1998. An increase in new diseases is apparent, which is an effect of two extensions in the MCR catchment area (from a base population of 2.65 million to 4.10 in 2002, and to 4.69 million in 2007).

[##] Due to the high frequency and good prognosis of non-malignant skin cancer (C44), no systematic ascertainment is performed for this diagnosis. C44 is not designated as a primary, but rather as a secondary tumor.

[###] DCO (death certificate only) identifies a cancer case that first becomes available to the MCR through the death certificate.

Some remarks regarding this cancer type

The results for leukemias should be interpreted with caution. As with other primarily non-surgically or non-radiologically treated cancer diseases, the MCR hardly manages to obtain even the simplest information on this cancer. The proportion of DCO cases indicates a situation that is far away from a satisfying cooperation. In the group of institutions that potentially participate in reporting are a few hospitals that refuse any contribution to MCR.

ICD-10 codes (ICD-10 2015) used for specifying cancer site

Code	Description
C91.-	Lymphoid leukaemia
C91.0	Acute lymphoblastic leukaemia [ALL]
C91.1	Chronic lymphocytic leukaemia of B-cell type
C91.3	Prolymphocytic leukaemia of B-cell type
C91.4	Hairy-cell leukaemia
C91.5	Adult T-cell lymphoma/leukaemia (HTLV-1-associated)
C91.6	Prolymophocytic leukaemia of T-cell type
C91.7	Other lymphoid leukaemia
C91.8	Mature B-cell leukaemia Burkitt-type
C91.9	Lymphoid leukaemia, unspecified

... or ...

Morphology codes (ICD-O-3 2011) used for specifying cancer site

Code	Description
9823/3	B-cell lymphocytic leukemia/small lymphocytic lymphoma

INCIDENCE

Table 1

Cases by year of diagnosis, proportions of DCO, further malignancies, deaths, and active follow-up (ALL PATIENTS) (incl. DCO)

Year of diagnosis	All cases n	DCO cases n	Prop. DCO %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	126	8	6.3	10.3	15.2	70.6	95.2
1999	126	8	6.3	11.5	15.1	64.3	94.4
2000	130	18	13.8	11.0	15.0	69.2	94.6
2001	179	42	23.5	10.9	14.8	68.7	94.4
2002	302	79	26.2	11.8	14.8	75.2	94.4 #
2003	262	69	26.3	12.0	14.5	68.3	93.5
2004	297	56	18.9	12.7	14.4	58.9	89.6
2005	287	60	20.9	13.5	14.2	63.1	89.5
2006	285	44	15.4	14.6	13.8	61.1	88.4
2007	337	61	18.1	14.9	13.0	56.1	73.3 #
2008	308	54	17.5	15.7	13.1	51.6	71.1
2009	316	51	16.1	16.0	12.0	48.1	69.6
2010	291	59	20.3	16.5	11.1	52.2	70.8
2011	298	54	18.1	17.2	10.9	42.3	68.5
2012	304	56	18.4	17.4	10.1	45.1	66.4
2013	261	52	19.9	17.7	9.3	44.4	67.0
2014	214	52	24.3	17.8	8.5	47.7	75.7
2015	128	49	38.3	18.3	8.5	56.3	96.9
2016	112	45	40.2	18.5	7.2	51.8	81.3 ##
1998-2016	4563	917	20.1	18.5	15.2	56.6	80.8

4,563 cases diagnosed 1998-2016 are related to a total of 4,555 patients. Currently, in 1,445 (31.7 %) of these 4,555 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 1,057 / 276 / 112 (23.2 % / 6.1 % / 2.5 %) patients exist having 2 / 3 / 4+ malignancies.

\# The increases of incident cases in 2002 and 2007 reflect the expansion to additional registry areas.

\## Please be aware that data of recent annual patient cohorts may not yet be fully processed. The years under evaluation can be retreived from the respective headings.

How to interpret:
In 2014, a subgroup of 214 cases has been diagnosed, of which 17.8 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 8.5 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 1a

Cases by year of diagnosis, proportions of
DCO, further malignancies, deaths, and active follow-up (MALES)
(incl. DCO)

Year of diagnosis	Males n	Males %	DCO cases n	Prop. DCO %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	75	59.5	2	2.7	10.7	17.9	69.3	93.3
1999	64	50.8	3	4.7	11.5	17.8	71.9	96.9
2000	81	62.3	11	13.6	10.9	17.7	71.6	93.8
2001	99	55.3	19	19.2	11.0	17.3	67.7	93.9
2002	174	57.6	35	20.1	12.0	17.2	71.3	92.5 #
2003	163	62.2	34	20.9	12.7	16.9	65.6	92.0
2004	179	60.3	29	16.2	13.2	16.5	59.8	89.4
2005	181	63.1	34	18.8	14.1	16.2	63.5	89.0
2006	183	64.2	24	13.1	15.8	15.8	61.7	89.6
2007	192	57.0	21	10.9	15.7	15.1	54.2	71.4 #
2008	182	59.1	25	13.7	16.3	14.9	48.9	68.7
2009	179	56.6	23	12.8	16.6	13.9	44.1	69.8
2010	168	57.7	32	19.0	17.0	12.6	51.2	70.8
2011	173	58.1	24	13.9	17.8	12.1	39.3	68.2
2012	180	59.2	27	15.0	17.9	10.4	39.4	62.2
2013	158	60.5	32	20.3	18.4	9.2	42.4	65.2
2014	138	64.5	25	18.1	18.4	8.1	41.3	73.9
2015	74	57.8	22	29.7	18.9	7.5	52.7	97.3
2016	65	58.0	25	38.5	19.0	4.7	46.2	84.6 ##
1998-2016	2708	59.3	447	16.5	19.0	17.9	54.6	79.9

2,708 cases diagnosed 1998-2016 are related to a total of 2,703 patients. Currently, in 932 (34.5 %) of these 2,703 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 664 / 179 / 89 (24.6 % / 6.6 % / 3.3 %) patients exist having 2 / 3 / 4+ malignancies.

The increases of incident cases in 2002 and 2007 reflect the expansion to additional registry areas.

Please be aware that data of recent annual patient cohorts may not yet be fully processed. The years under evaluation can be retreived from the respective headings.

How to interpret:
In 2014, a subgroup of 138 cases has been diagnosed, of which 18.4 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 8.1 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 1b

Cases by year of diagnosis, proportions of
DCO, further malignancies, deaths, and active follow-up (FEMALES)
(incl. DCO)

Year of diagnosis	Females n	Females %	DCO cases n	Prop. DCO %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %	
1998	51	40.5	6	11.8	9.8	11.2	72.5	98.0	
1999	62	49.2	5	8.1	11.5	11.3	56.5	91.9	
2000	49	37.7	7	14.3	11.1	11.0	65.3	95.9	
2001	80	44.7	23	28.8	10.7	11.1	70.0	95.0	
2002	128	42.4	44	34.4	11.6	11.1	80.5	96.9	#
2003	99	37.8	35	35.4	11.1	11.0	72.7	96.0	
2004	118	39.7	27	22.9	11.9	11.4	57.6	89.8	
2005	106	36.9	26	24.5	12.6	11.3	62.3	90.6	
2006	102	35.8	20	19.6	13.0	11.0	59.8	86.3	
2007	145	43.0	40	27.6	13.7	10.2	58.6	75.9	#
2008	126	40.9	29	23.0	14.8	10.5	55.6	74.6	
2009	137	43.4	28	20.4	15.1	9.3	53.3	69.3	
2010	123	42.3	27	22.0	15.6	8.9	53.7	70.7	
2011	125	41.9	30	24.0	16.3	9.2	46.4	68.8	
2012	124	40.8	29	23.4	16.6	9.8	53.2	72.6	
2013	103	39.5	20	19.4	16.7	9.4	47.6	69.9	
2014	76	35.5	27	35.5	16.9	9.1	59.2	78.9	
2015	54	42.2	27	50.0	17.3	9.9	61.1	96.3	
2016	47	42.0	20	42.6	17.8	10.6	59.6	76.6	##
1998-2016	1855	40.7	470	25.3	17.8	11.2	59.5	82.0	

1,855 cases diagnosed 1998-2016 are related to a total of 1,852 patients. Currently, in 513 (27.7 %) of these 1,852 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 393 / 97 / 23 (21.2 % / 5.2 % / 1.2 %) patients exist having 2 / 3 / 4+ malignancies.

The increases of incident cases in 2002 and 2007 reflect the expansion to additional registry areas.

Please be aware that data of recent annual patient cohorts may not yet be fully processed. The years under evaluation can be retreived from the respective headings.

How to interpret:
In 2014, a subgroup of 76 cases has been diagnosed, of which 16.9 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 9.1 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 2

Incidence measures by year of diagnosis including DCO cases
(with respect to registry area expansion from 2.65 to 4.10 m as of 2002,
and from 4.10 to 4.81 m as of 2007, respectively)

Year of diagnosis	Males n	Females n	Males Inc. raw	Fem. Inc. raw	Males Inc. WS	Fem. Inc. WS	Males Inc. ES	Fem. Inc. ES	Males Inc. BRD-S	Fem. Inc. BRD-S
1998	75	51	6.8	4.3	5.1	2.5	6.4	3.2	7.5	3.7
1999	64	62	5.7	5.2	4.2	4.3	5.4	4.6	6.4	4.8
2000	81	49	7.1	4.1	5.3	2.7	6.8	3.2	7.6	3.5
2001	99	80	8.5	6.6	6.4	4.0	8.1	4.9	9.4	5.5
2002	174	128	9.3	6.5	6.4	3.1	8.3	4.3	9.9	5.3
2003	163	99	8.7	5.0	5.9	3.0	7.7	3.6	9.4	4.2
2004	179	118	9.5	6.0	6.7	3.5	8.3	4.3	9.9	4.9
2005	181	106	9.6	5.3	6.7	3.2	8.3	3.8	10.1	4.5
2006	183	102	9.6	5.1	6.8	3.0	8.4	3.6	9.8	4.2
2007	192	145	8.7	6.3	5.4	4.0	7.2	4.6	8.9	5.2
2008	182	126	8.2	5.4	5.8	3.2	6.9	3.8	8.0	4.3
2009	179	137	8.0	5.9	4.7	3.4	6.4	4.1	7.8	4.6
2010	168	123	7.5	5.3	4.8	2.9	6.0	3.5	7.4	4.0
2011	173	125	7.7	5.3	5.2	3.2	6.3	3.7	7.3	4.1
2012	180	124	7.9	5.3	5.3	3.7	6.2	3.9	7.6	4.2
2013	158	103	6.9	4.3	4.4	2.7	5.4	3.1	6.5	3.6
2014	138	76	5.9	3.2	3.4	1.3	4.5	1.7	5.4	2.3
2015	74	54	3.1	2.2	1.4	0.8	2.2	1.2	2.8	1.5
2016	65	47	2.7	1.9	1.3	0.6	1.9	0.9	2.5	1.2
1998-2016	2708	1855	7.4	4.8	4.9	2.8	6.1	3.4	7.3	3.9

The computation of the incidence measures includes all cancers, irrespective of first or subsequent malignancy.

Table 3

Age distribution parameters by year of diagnosis (ALL PATIENTS)
(incl. DCO)

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	126	61.2	21.1	1.4	95.8	36.3	54.9	64.7	76.0	82.8
1999	126	57.9	23.1	0.3	89.4	6.0	54.1	62.7	74.0	79.8
2000	130	61.3	20.8	2.1	91.2	29.4	55.5	63.7	74.1	84.2
2001	179	62.7	22.2	1.4	94.0	17.0	56.6	67.0	76.3	87.3
2002	302	65.7	20.2	2.6	95.0	38.3	60.4	68.7	78.9	87.9
2003	262	64.4	22.3	0.3	98.9	33.3	57.6	69.2	79.1	85.6
2004	297	62.8	21.8	1.4	98.6	29.0	56.8	67.6	77.4	84.5
2005	287	63.4	23.8	0.6	97.1	20.3	57.7	70.8	78.0	85.1
2006	285	63.8	23.0	1.3	95.4	19.3	58.4	69.5	78.3	85.6
2007	337	64.5	22.1	0.3	99.8	30.3	57.0	69.3	80.1	86.1
2008	308	63.9	24.0	0.4	97.4	13.9	60.5	70.0	79.3	86.2
2009	316	66.1	20.3	1.3	98.6	43.0	57.9	70.0	80.2	86.8
2010	291	65.8	23.8	0.3	101	31.8	55.4	72.8	81.9	88.4
2011	298	64.0	24.2	2.5	101	13.1	55.8	70.8	80.3	87.7
2012	304	62.6	25.7	0.6	96.9	13.0	55.0	71.2	80.8	87.1
2013	261	64.2	23.7	0.1	100	20.8	57.0	70.8	80.4	87.4
2014	214	68.8	20.2	2.7	98.3	42.4	59.6	72.8	82.8	90.1
2015	128	74.0	15.3	6.2	96.6	55.1	67.3	76.3	84.1	89.1
2016	112	73.8	16.4	17.5	97.5	55.0	67.3	77.2	85.4	90.4
1998-2016	4563	64.6	22.5	0.1	101	28.6	57.7	70.1	79.6	86.9

Table 3a

Age distribution parameters by year of diagnosis (MALES)
(incl. DCO)

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	75	58.1	21.5	2.0	95.8	33.9	51.3	62.3	72.5	81.0
1999	64	59.4	21.2	0.3	89.4	31.9	54.1	62.2	74.4	80.4
2000	81	60.8	19.1	2.6	91.1	43.8	55.5	63.7	71.0	78.8
2001	99	59.8	20.5	1.4	90.7	17.0	53.1	65.3	72.6	79.6
2002	174	62.0	20.8	2.6	90.9	31.1	55.9	66.1	75.5	82.5
2003	163	62.7	20.9	1.6	90.7	33.3	56.3	67.4	76.5	83.1
2004	179	61.0	21.8	1.4	95.2	25.6	55.9	65.5	75.0	81.9
2005	181	62.1	23.4	0.7	94.6	20.3	56.5	69.0	76.9	82.7
2006	183	62.3	23.0	1.3	95.4	19.3	56.8	68.2	77.5	84.1
2007	192	64.3	19.5	0.3	97.8	39.9	56.7	69.0	77.7	83.3
2008	182	62.0	24.3	0.4	93.7	11.8	60.5	69.6	77.1	83.2
2009	179	66.2	17.7	2.2	97.0	47.0	57.9	69.7	77.7	84.5
2010	168	64.3	23.3	0.3	101	31.2	53.8	71.5	80.5	87.0
2011	173	62.6	23.2	2.5	101	16.5	54.3	69.3	77.8	84.3
2012	180	62.9	24.6	2.4	95.2	15.7	56.3	71.2	79.8	84.8
2013	158	63.8	23.3	2.3	100	18.7	55.3	71.7	78.9	87.2
2014	138	66.2	20.2	3.7	95.9	40.8	57.2	70.5	79.6	87.9
2015	74	72.5	15.5	6.2	96.6	53.9	64.3	75.7	82.2	86.6
2016	65	70.1	18.3	17.5	97.5	42.7	60.6	75.1	81.0	88.0
1998-2016	2708	63.2	21.8	0.3	101	29.0	56.4	68.7	77.5	84.3

Table 3b

Age distribution parameters by year of diagnosis (FEMALES)
(incl. DCO)

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	51	65.7	19.7	1.4	90.3	41.0	59.7	68.5	77.9	85.2
1999	62	56.3	24.9	1.5	88.4	4.1	52.3	63.3	73.6	77.1
2000	49	62.2	23.6	2.1	91.2	4.6	57.5	63.7	77.3	86.5
2001	80	66.3	23.7	2.8	94.0	25.2	60.5	71.9	82.2	90.2
2002	128	70.9	18.2	2.9	95.0	49.5	63.8	74.3	83.3	90.1
2003	99	67.1	24.3	0.3	98.9	29.4	59.4	73.7	81.7	90.6
2004	118	65.5	21.7	4.3	98.6	35.3	58.1	69.7	80.2	87.3
2005	106	65.7	24.3	0.6	97.1	20.8	63.2	74.5	79.7	88.8
2006	102	66.6	22.9	2.5	93.9	32.7	61.2	73.0	81.3	86.6
2007	145	64.7	25.1	1.0	99.8	13.3	57.4	71.3	82.5	87.6
2008	126	66.7	23.4	1.4	97.4	22.0	60.7	71.6	82.6	88.3
2009	137	65.9	23.3	1.3	98.6	28.2	58.4	71.2	82.9	88.1
2010	123	67.9	24.4	0.8	97.5	32.6	60.9	75.3	84.3	89.5
2011	125	65.9	25.5	2.5	96.7	13.1	57.2	73.2	83.7	89.7
2012	124	62.2	27.3	0.6	96.9	11.8	54.1	71.4	84.1	88.7
2013	103	64.7	24.4	0.1	97.3	24.7	59.1	69.7	81.5	90.4
2014	76	73.4	19.7	2.7	98.3	43.3	69.5	79.1	86.8	92.1
2015	54	76.0	15.0	28.7	95.9	61.9	69.1	77.1	87.9	92.1
2016	47	78.9	11.9	41.4	96.0	60.4	73.3	80.8	88.1	93.5
1998-2016	1855	66.6	23.4	0.1	99.8	28.2	60.0	72.8	82.5	88.9

Table 4

Age distribution by 5-year age group and sex for period 2007-2016
(incl. DCO)

Age at diagnosis Years	Cases n	%	Males Cum.%	n	%	Females Cum.%	n	%	Cum.%
0-4	89	3.5	3.5	52	3.4	3.4	37	3.5	3.5
5-9	61	2.4	5.8	31	2.1	5.5	30	2.8	6.3
10-14	38	1.5	7.3	21	1.4	6.9	17	1.6	7.9
15-19	36	1.4	8.7	22	1.5	8.3	14	1.3	9.2
20-24	21	0.8	9.5	13	0.9	9.2	8	0.8	10.0
25-29	18	0.7	10.2	8	0.5	9.7	10	0.9	10.9
30-34	22	0.9	11.1	13	0.9	10.6	9	0.8	11.8
35-39	28	1.1	12.2	17	1.1	11.7	11	1.0	12.8
40-44	50	1.9	14.1	27	1.8	13.5	23	2.2	15.0
45-49	70	2.7	16.9	52	3.4	17.0	18	1.7	16.7
50-54	108	4.2	21.1	78	5.2	22.1	30	2.8	19.5
55-59	150	5.8	26.9	92	6.1	28.2	58	5.5	25.0
60-64	177	6.9	33.8	105	7.0	35.2	72	6.8	31.8
65-69	301	11.7	45.5	195	12.9	48.1	106	10.0	41.8
70-74	368	14.3	59.8	241	16.0	64.1	127	12.0	53.8
75-79	320	12.5	72.3	198	13.1	77.2	122	11.5	65.3
80-84	318	12.4	84.7	185	12.3	89.5	133	12.5	77.8
85+	394	15.3	100.0	159	10.5	100.0	235	22.2	100.0
All ages	2569	100.0		1509	100.0		1060	100.0	

Table 5

Age-specific incidence, DCO rate and proportion of all cancers
for period 2007-2016

Age at diagnosis Years	Males n	Females n	Males Age-spec. incid.	Females Age-spec. incid.	Males DCO rate n=256 %	Females DCO rate n=276 %	Males Prop.all cancers n=113978 %	Females Prop.all cancers n=112253 %
0- 4	52	37	4.6	3.5			26.5	24.8
5- 9	31	30	2.8	2.9	3.2		29.8	35.7
10-14	21	17	1.8	1.6			18.3	16.8
15-19	22	14	1.8	1.2			8.7	6.8
20-24	13	8	0.9	0.6		12.5	2.8	2.1
25-29	8	10	0.5	0.6		10.0	1.2	1.2
30-34	13	9	0.8	0.6	7.7	11.1	1.4	0.6
35-39	17	11	1.0	0.7		9.1	1.2	0.4
40-44	27	23	1.4	1.3			1.2	0.5
45-49	52	18	2.6	0.9			1.3	0.3
50-54	78	30	4.5	1.8	3.8	6.7	1.3	0.3
55-59	92	58	6.5	3.9	6.5	1.7	1.0	0.6
60-64	105	72	8.6	5.4	5.7	8.3	0.8	0.6
65-69	195	106	16.5	8.2	7.7	7.5	1.0	0.8
70-74	241	127	21.8	10.0	7.9	11.0	1.1	0.9
75-79	198	122	24.9	12.2	20.7	21.3	1.2	0.9
80-84	185	132	40.2	18.7	29.7	43.2	1.7	1.2
85+	159	235	51.9	32.0	68.6	67.2	2.0	1.8
All ages	1509	1059			17.0	26.1	1.3	0.9
Incidence								
Raw			6.6	4.5				
WS			4.1	2.5				
ES			5.2	3.0				
BRD-S			6.3	3.5				

The age-specific incidence characterizes the disease risk in a particular age group. The age distribution depends on the patient population frequency in each age group and reflects the tangible clinical picture of everyday patients care (see following chart).

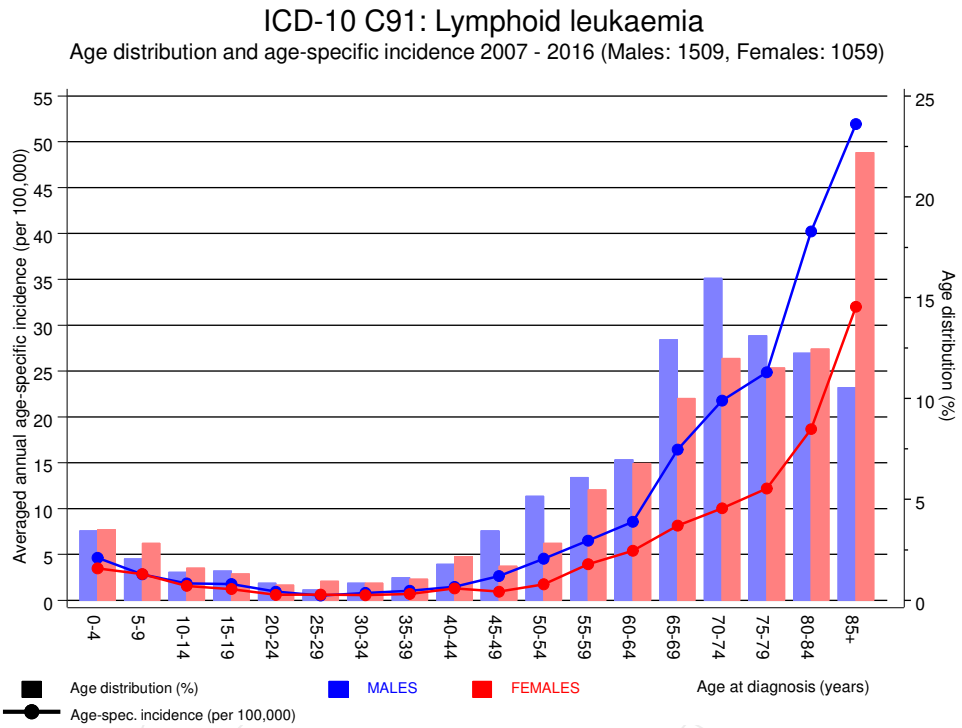


Figure 6. Age distribution (males: mean=64.7 yrs, median=70.5 yrs; females: mean=67.1 yrs, median=73.6 yrs) and age-specific incidence.

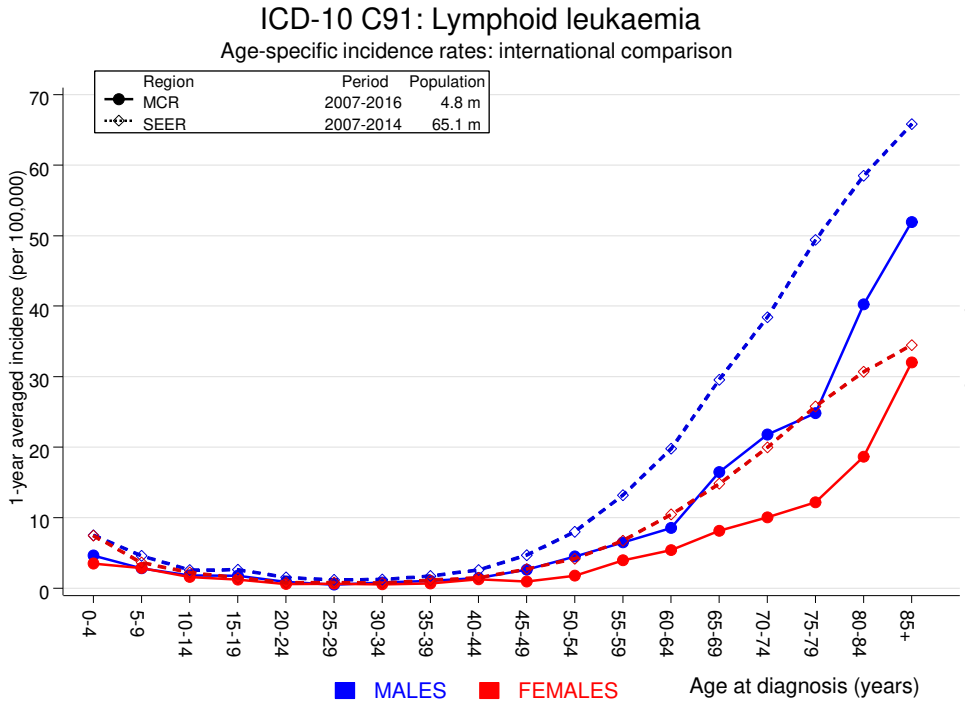


Figure 6a. Age-specific incidence in MCR registry areas compared to SEER (Surveillance, Epidemiology, and End Results, USA).

Reference:
Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Incidence - SEER 18 Regs Research Data, released April 2014, based on the November 2013 submission. http://www.seer.cancer.gov.

Table 7a

Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of further malignancies for period 1998-2016
MALES

Diagnosis		Observed n	Expected n	SIR	CI 95%	CI 95%		EAR	DCO %
C03-C06	Oral cavity	2	1.2	1.7	0.2	6.1		0.9	
C07-C08	Salivary gland	5	0.3	14.4	4.7	33.5	#	5.0	
C15	Oesophagus	5	2.7	1.8	0.6	4.3		2.4	
C16	Stomach	16	6.0	2.7	1.5	4.4	#	10.7	
C18	Colon	28	14.4	1.9	1.3	2.8	#	14.6	3.6
C19-C20	Rectum	20	7.9	2.5	1.5	3.9	#	12.9	
C22	Liver	7	4.2	1.7	0.7	3.4		3.0	14.3
C25	Pancreas	10	5.6	1.8	0.9	3.3		4.7	
C33-C34	Lung	49	17.4	2.8	2.1	3.7	#	33.8	6.1
C43	Malign. melanoma	34	6.4	5.3	3.7	7.4	#	29.5	
C46,C49	Soft tissue	5	0.8	6.0	1.9	14.0	#	4.5	
C50	Breast	2	0.4	5.3	0.6	19.0		1.7	
C61	Prostate	85	42.6	2.0	1.6	2.5	#	45.4	4.7
C62	Testis	3	0.4	7.8	1.6	22.7	#	2.8	
C64	Kidney	12	5.2	2.3	1.2	4.1	#	7.3	
C65	Renal pelvis	2	0.7	3.1	0.4	11.1		1.4	
C67	Bladder	18	6.8	2.7	1.6	4.2	#	12.0	
C70-C72	CNS cancer	8	1.9	4.1	1.8	8.2	#	6.5	12.5
C73	Thyroid	3	0.9	3.2	0.7	9.4		2.2	
C76-C79	CUP	5	2.5	2.0	0.6	4.7		2.7	
C81	Hodgkin lymphoma	6	0.3	17.2	6.3	37.4	#	6.0	
C82-C85	NHL	25	6.1	4.1	2.6	6.0	#	20.2	12.0
C90	Mult. myeloma	6	2.0	3.1	1.1	6.6	#	4.3	
C91-C96	Leukaemia	12	2.5	4.8	2.5	8.4	#	10.2	25.0
Others, specified		10	5.8	1.7	0.8	3.2		4.5	10.0
Not observed		0	4.3	0.0	0.0	0.9	#	-4.6	
All further malignancies		378	149.3	2.5	2.3	2.8	#	244.8	4.5

Patients	2248
Median age at next malignancy (years)	73.4
Person-years	9340
Mean observation time (years)	4.2
Median observation time (years)	3.1

The occurrence of further malignancy listed is statistically significant.

Observed further malignancies with count 1 are pooled in category “Others, specified”.

Table 7b

Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of further malignancies for period 1998–2016
FEMALES

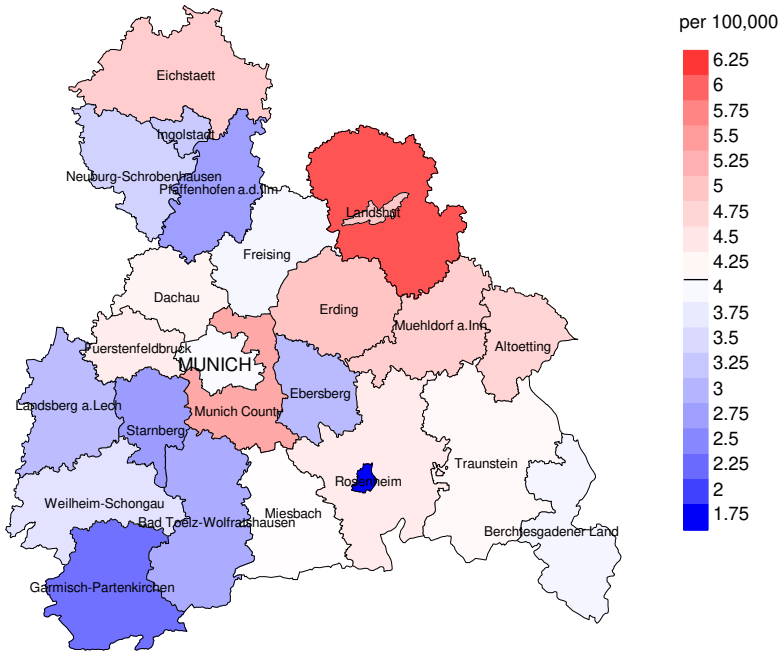
Diagnosis		Observed n	Expected n	SIR	CI 95%	CI 95%		EAR	DCO %
C09–C10	Oropharynx	2	0.2	8.7	1.1	31.4	#	3.1	
C16	Stomach	4	2.2	1.8	0.5	4.6		3.1	
C18	Colon	11	6.2	1.8	0.9	3.2		8.4	9.1
C19–C20	Rectum	5	2.6	1.9	0.6	4.5		4.2	
C21	Anus/canal	2	0.3	6.2	0.8	22.4		3.0	
C22	Liver	2	0.8	2.6	0.3	9.4		2.2	
C25	Pancreas	6	2.9	2.1	0.8	4.5		5.5	
C33–C34	Lung	17	4.5	3.7	2.2	6.0	#	22.0	5.9
C43	Malign. melanoma	10	2.2	4.5	2.2	8.3	#	13.7	
C50	Breast	45	17.9	2.5	1.8	3.4	#	47.7	
C54	Corpus uteri	7	3.4	2.0	0.8	4.2		6.3	
C56	Ovary	5	2.5	2.0	0.6	4.6		4.4	
C64	Kidney	8	1.6	5.1	2.2	10.1	#	11.3	
C70–C72	CNS cancer	3	0.9	3.5	0.7	10.2		3.8	
C73	Thyroid	5	0.9	5.3	1.7	12.3	#	7.2	
C76–C79	CUP	4	1.1	3.5	1.0	9.0		5.0	
C81	Hodgkin lymphoma	2	0.1	16.9	2.0	61.1	#	3.3	
C82–C85	NHL	21	2.5	8.5	5.2	12.9	#	32.7	9.5
C90	Mult. myeloma	4	0.8	5.0	1.4	12.8	#	5.6	
C91–C96	Leukaemia	7	1.0	6.7	2.7	13.9	#	10.5	
Others, specified		7	1.8	3.9	1.6	8.0	#	9.2	
Not observed		0	5.1	0.0	0.0	0.7	#	-8.9	
All further malignancies		177	61.7	2.9	2.5	3.3	#	203.3	2.3

Patients	1393
Median age at next malignancy (years)	73.1
Person-years	5669
Mean observation time (years)	4.1
Median observation time (years)	2.8

The occurrence of further malignancy listed is statistically significant.

Observed further malignancies with count 1 are pooled in category “Others, specified”.

Average incidence (world standard population) 2007 - 2016: Males



Average incidence (world standard population) 2007 - 2016: Females

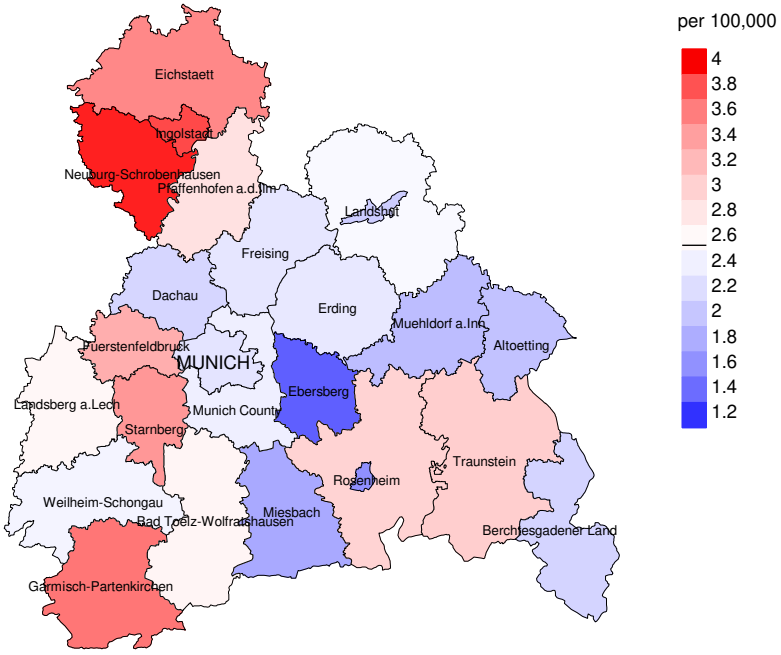
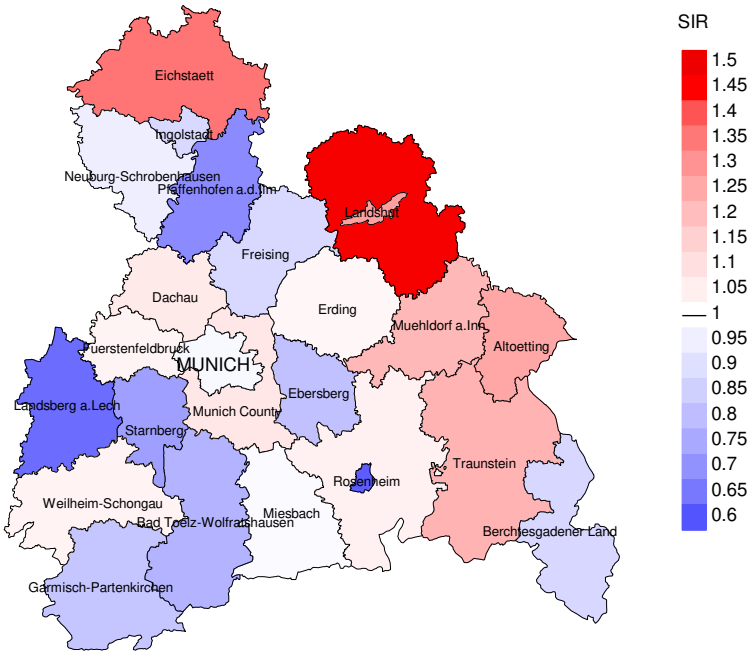


Figure 8a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 4.1/100,000 WS N=1,509, females 2.5/100,000 WS N=1,059).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 24 women were identified with newly diagnosed lymphoid leukaemia. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 1.3/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.7 and 2.6/100,000.

Standardized incidence ratio (SIR) 2007 - 2016: Males



Standardized incidence ratio (SIR) 2007 - 2016: Females

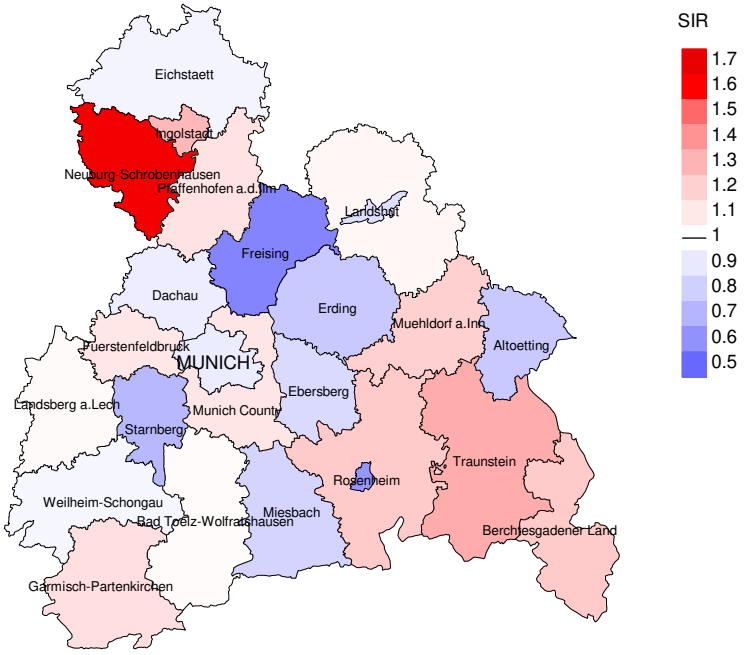


Figure 8b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=1,509, females N=1,059).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 24 women were identified with newly diagnosed lymphoid leukaemia. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 0.84. Though, the value of this parameter may vary with an underlying probability of 99% between 0.46 and 1.39, and is therefore not statistically striking.

MORTALITY

Table 9a

Annual cohorts: Incident cancers, follow-up status, proportion of DCO, deaths among the annual cohorts and proportion of available death certificates (with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.81 m as of 2007, respectively)

Year of diagnosis	Incident cases n	Prop. actively followed %	Prop. DCO %	Deaths n	Prop. deaths %	Prop. deaths with death certific. %
1998	126	95.2	6.3	89	70.6	98.9
1999	126	94.4	6.3	81	64.3	96.3
2000	130	94.6	13.8	90	69.2	97.8
2001	179	94.4	23.5	123	68.7	98.4
2002	302	94.4	26.2	227	75.2	98.7
2003	262	93.5	26.3	179	68.3	99.4
2004	297	89.6	18.9	175	58.9	99.4
2005	287	89.5	20.9	181	63.1	97.8
2006	285	88.4	15.4	174	61.1	98.3
2007	337	73.3	18.1	189	56.1	98.4
2008	308	71.1	17.5	159	51.6	98.1
2009	316	69.6	16.1	152	48.1	99.3
2010	291	70.8	20.3	152	52.2	98.7
2011	298	68.5	18.1	126	42.3	96.8
2012	304	66.4	18.4	137	45.1	97.8
2013	261	67.0	19.9	116	44.4	97.4
2014	214	75.7	24.3	102	47.7	97.1
2015	128	96.9	38.3	72	56.3	94.4
2016	112	81.3	40.2	58	51.8	94.8
1998-2016	4563	80.8	20.1	2582	56.6	98.1

Table 9b

Annual cohorts of incident cancers and deaths, proportion of death certificates and cases deceased within the same year of being diagnosed with cancer (incl. DCO)
(with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.81 m as of 2007, respectively)

Year of diagnosis/ death	Incident cases n	Deaths n	Prop. deaths with death certific. %	Deaths in same year n	Prop. deaths in same year %
1998	126	50	98.0	10	7.9
1999	126	59	93.2	7	5.6
2000	130	65	93.8	20	15.4
2001	179	109	96.3	46	25.7
2002	302	153	98.7	92	30.5
2003	262	142	98.6	83	31.7
2004	297	141	99.3	62	20.9
2005	287	169	100.0	73	25.4
2006	285	163	98.2	61	21.4
2007	337	184	98.4	78	23.1
2008	308	182	98.9	65	21.1
2009	316	158	100.0	57	18.0
2010	291	183	99.5	73	25.1
2011	298	185	99.5	61	20.5
2012	304	200	98.5	66	21.7
2013	261	195	98.5	69	26.4
2014	214	195	99.5	65	30.4
2015	128	194	97.9	59	46.1
2016	112	166	98.2	55	49.1
1998-2016	4563	2893	98.5	1102	24.2

Table 9c

Annual cohorts of deaths, proportion of cancer-related and non-cancer-related deaths, and cancer recorded on death certificates (incl. DCO)
(with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.81 m as of 2007, respectively)

Year of death	Deaths n	Prop. cancer-related %	Prop. non-cancer-related %	Prop. cancer recorded on death certificate %
1998	50	64.0	36.0	91.8
1999	59	67.8	32.2	89.1
2000	65	66.2	33.8	98.4
2001	109	59.6	40.4	93.3
2002	153	77.8	22.2	96.0
2003	142	81.7	18.3	95.0
2004	141	85.8	14.2	95.0
2005	169	82.2	17.8	97.0
2006	163	78.5	21.5	92.5
2007	184	77.2	22.8	91.2
2008	182	82.4	17.6	90.6
2009	158	83.5	16.5	93.0
2010	183	79.8	20.2	93.4
2011	185	75.7	24.3	89.1
2012	200	78.5	21.5	89.8
2013	195	73.8	26.2	85.9
2014	195	68.7	31.3	85.6
2015	194	73.2	26.8	85.3
2016	166	65.7	34.3	86.5
1998-2016	2893	76.0	24.0	91.0

Table 10a

Medians of age at death according to the grouping in Table 9
MALES

Year of death	Deaths n	Age at death (all causes) Years	Age at death (cancer-related) Years	Age at death (non-cancer-related) Years	Age at death (according to death certificate) Years
1998	31	68.2	67.6	83.2	67.9
1999	34	71.6	65.3	82.7	68.8
2000	44	71.4	70.5	76.6	71.4
2001	55	73.7	72.0	78.8	72.2
2002	88	75.5	75.4	76.4	76.5
2003	80	72.4	72.3	75.8	72.4
2004	88	73.3	72.4	79.8	73.3
2005	102	76.2	73.7	79.4	75.7
2006	98	74.3	73.0	82.4	73.7
2007	102	76.4	75.2	80.5	76.4
2008	111	75.1	74.4	80.9	75.0
2009	92	78.9	76.7	84.0	78.9
2010	108	76.9	76.5	79.4	77.4
2011	112	76.6	75.9	79.3	76.2
2012	125	77.5	76.3	82.0	77.7
2013	123	75.3	74.3	82.6	75.6
2014	123	78.9	76.3	83.6	77.8
2015	116	78.8	77.0	82.5	78.2
2016	102	80.4	80.2	81.2	80.2
1998-2016	1734	76.3	74.8	80.9	76.0

Deaths of patients are considered to be cancer-related, in case that fact was recorded on the death certificate, or patients had suffered from metastasis or recurrence.

Table 10b

Medians of age at death according to the grouping in Table 9
FEMALES

Year of death	Deaths n	Age at death (all causes) Years	Age at death (cancer-related) Years	Age at death (non-cancer-related) Years	Age at death (according to death certificate) Years
1998	19	78.6	73.6	80.4	76.9
1999	25	79.5	73.2	83.9	76.5
2000	21	83.4	78.5	88.6	83.3
2001	54	77.8	76.2	80.6	77.3
2002	65	82.4	74.9	88.7	79.2
2003	62	78.9	77.4	85.2	78.4
2004	53	78.4	76.9	84.8	77.5
2005	67	80.8	78.1	89.3	80.7
2006	65	78.0	77.8	81.8	77.8
2007	82	81.1	77.3	87.2	81.1
2008	71	82.7	80.1	90.1	81.9
2009	66	79.5	77.3	83.5	79.5
2010	75	82.3	82.0	89.6	82.2
2011	73	80.9	76.9	85.0	79.8
2012	75	79.3	78.9	82.3	78.9
2013	72	82.1	81.8	86.2	82.2
2014	72	82.1	79.2	86.4	81.9
2015	78	78.5	76.7	83.7	76.7
2016	64	80.8	77.6	81.9	79.9
1998-2016	1159	80.2	77.9	85.5	79.4

By 2010, life expectancy at birth was 77.5 years for boys and 82.6 years for girls.

Deaths of patients are considered to be cancer-related, in case that fact was recorded on the death certificate, or patients had suffered from metastasis or recurrence.

Table 11a

Mortality measures (cancer-related death) and mortality-incidence-index
by year of death
MALES

Year of death	Deaths n	Mort. raw	MI-Index raw	Mort. WS	MI-Index WS	Mort. ES	MI-Index ES	Mort. BRD-S	MI-Index BRD-S
1998	23	2.1	0.31	1.6	0.31	2.0	0.32	2.4	0.32
1999	21	1.9	0.33	1.5	0.37	1.8	0.34	2.1	0.33
2000	31	2.7	0.38	2.1	0.39	2.6	0.39	3.1	0.40
2001	36	3.1	0.36	1.8	0.29	2.8	0.34	3.8	0.40
2002	72	3.9	0.41	2.1	0.33	3.3	0.40	4.7	0.47
2003	66	3.5	0.40	2.0	0.33	3.0	0.39	4.0	0.43
2004	76	4.0	0.42	2.2	0.33	3.3	0.40	4.5	0.45
2005	82	4.3	0.45	2.4	0.35	3.5	0.42	4.8	0.47
2006	77	4.0	0.42	2.0	0.30	3.1	0.37	4.2	0.43
2007	82	3.7	0.43	2.0	0.36	2.9	0.40	4.0	0.45
2008	91	4.1	0.50	2.0	0.34	3.0	0.44	4.2	0.52
2009	80	3.6	0.45	1.6	0.35	2.6	0.41	3.6	0.47
2010	85	3.8	0.51	1.5	0.32	2.5	0.42	3.8	0.51
2011	90	4.0	0.52	1.8	0.35	2.8	0.45	4.0	0.54
2012	93	4.1	0.52	1.8	0.35	2.8	0.45	4.0	0.52
2013	91	4.0	0.58	1.7	0.39	2.6	0.49	3.6	0.56
2014	86	3.7	0.62	1.5	0.43	2.4	0.52	3.4	0.62
2015	89	3.7	1.20	1.7	1.15	2.5	1.15	3.4	1.21
2016	71	3.0	1.09	1.0	0.76	1.7	0.89	2.6	1.06
1998-2016	1342	3.6	0.50	1.8	0.37	2.7	0.44	3.8	0.51

Table 11b

Mortality measures (cancer-related death) and mortality-incidence-index
by year of death
FEMALES

Year of death	Deaths n	Mort. raw	MI-Index raw	Mort. WS	MI-Index WS	Mort. ES	MI-Index ES	Mort. BRD-S	MI-Index BRD-S
1998	9	0.8	0.18	0.4	0.17	0.5	0.16	0.6	0.17
1999	19	1.6	0.31	0.8	0.18	1.0	0.23	1.4	0.28
2000	12	1.0	0.24	0.6	0.23	0.7	0.23	0.8	0.23
2001	29	2.4	0.37	0.9	0.23	1.4	0.30	2.0	0.37
2002	47	2.4	0.37	1.1	0.36	1.6	0.37	2.0	0.38
2003	50	2.5	0.51	1.0	0.35	1.5	0.43	2.1	0.50
2004	45	2.3	0.38	1.0	0.30	1.4	0.33	1.8	0.37
2005	57	2.9	0.54	1.0	0.30	1.5	0.41	2.1	0.47
2006	51	2.5	0.50	1.0	0.34	1.5	0.41	2.1	0.50
2007	60	2.6	0.42	1.0	0.26	1.5	0.32	2.0	0.38
2008	59	2.5	0.47	1.0	0.30	1.4	0.36	1.9	0.43
2009	52	2.2	0.38	1.0	0.29	1.4	0.34	1.8	0.38
2010	61	2.6	0.50	1.0	0.32	1.4	0.39	1.9	0.47
2011	50	2.1	0.40	0.9	0.27	1.2	0.33	1.5	0.38
2012	64	2.7	0.52	0.9	0.24	1.3	0.34	1.9	0.45
2013	53	2.2	0.51	0.8	0.31	1.2	0.38	1.6	0.45
2014	48	2.0	0.63	0.8	0.67	1.1	0.64	1.4	0.61
2015	53	2.2	0.98	0.8	1.08	1.2	1.02	1.6	1.08
2016	38	1.5	0.81	0.5	0.85	0.8	0.83	1.0	0.86
1998-2016	857	2.2	0.46	0.9	0.32	1.3	0.38	1.7	0.44

Table 12

Age distribution of age at death (cancer-related) for period 2007-2016
(**incl. multiple malignancies**)

Age at death Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4	3	0.2	0.2			0.0	3	0.6	0.6
5-9	8	0.6	0.8	5	0.6	0.6	3	0.6	1.1
10-14	10	0.7	1.5	2	0.2	0.8	8	1.5	2.6
15-19	8	0.6	2.1	5	0.6	1.4	3	0.6	3.2
20-24	8	0.6	2.7	5	0.6	2.0	3	0.6	3.7
25-29	6	0.4	3.1	5	0.6	2.6	1	0.2	3.9
30-34	11	0.8	3.9	7	0.8	3.4	4	0.7	4.6
35-39	10	0.7	4.6	5	0.6	4.0	5	0.9	5.6
40-44	14	1.0	5.6	10	1.2	5.1	4	0.7	6.3
45-49	16	1.1	6.7	6	0.7	5.8	10	1.9	8.2
50-54	26	1.9	8.6	17	2.0	7.8	9	1.7	9.9
55-59	46	3.3	11.9	31	3.6	11.4	15	2.8	12.6
60-64	81	5.8	17.7	52	6.1	17.5	29	5.4	18.0
65-69	126	9.0	26.7	88	10.3	27.7	38	7.1	25.1
70-74	216	15.5	42.2	143	16.7	44.4	73	13.6	38.7
75-79	255	18.3	60.5	174	20.3	64.7	81	15.1	53.7
80-84	275	19.7	80.2	165	19.2	83.9	110	20.4	74.2
85+	277	19.8	100.0	138	16.1	100.0	139	25.8	100.0
All ages	1396	100.0		858	100.0		538	100.0	

Table 13

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2016
(**incl. multiple malignancies**)

Age at death Years	Males n	Females n	Males Age-spec. mortal.	MI-index	Females Age-spec. mortal.	MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4		3			0.3	0.08		20.0
5- 9	5	3	0.5	0.16	0.3	0.10	20.8	16.7
10-14	2	8	0.2	0.10	0.7	0.47	8.7	33.3
15-19	5	3	0.4	0.23	0.3	0.21	11.4	13.6
20-24	5	3	0.4	0.38	0.2	0.38	8.8	9.1
25-29	5	1	0.3	0.63	0.1	0.10	6.8	1.4
30-34	7	4	0.4	0.54	0.3	0.44	6.7	3.3
35-39	5	5	0.3	0.29	0.3	0.45	2.5	1.8
40-44	10	4	0.5	0.37	0.2	0.17	2.0	0.6
45-49	6	10	0.3	0.12	0.5	0.56	0.5	0.8
50-54	17	9	1.0	0.22	0.5	0.30	0.8	0.5
55-59	31	15	2.2	0.34	1.0	0.26	0.9	0.5
60-64	52	29	4.2	0.50	2.2	0.40	1.0	0.8
65-69	88	38	7.4	0.45	2.9	0.36	1.2	0.7
70-74	143	73	12.9	0.59	5.8	0.57	1.5	1.1
75-79	174	81	21.8	0.88	8.1	0.66	1.9	1.2
80-84	165	110	35.9	0.89	15.5	0.83	2.2	1.6
85+	138	139	45.1	0.87	18.9	0.59	2.1	1.5
All ages	858	538					1.6	1.2
Mortality								
Raw			3.8	0.57	2.3	0.51		
WS			1.7	0.40	0.9	0.34		
ES			2.6	0.49	1.2	0.41		
BRD-S			3.6	0.58	1.6	0.48		
PYLL-70								
per 100,000			16.2		12.5			
ES			16.0		13.8			
AYLL-70			13.7		18.5			

Table 14a

Further malignancies in deaths in period 1998-2016
MALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C16	Stomach	17	2.1	4	23.5	2	11.8	11	64.7
C18	Colon	59	7.3	20	33.9	7	11.9	32	54.2
C19-C20	Rectum	34	4.2	9	26.5	6	17.6	19	55.9
C25	Pancreas	14	1.7			4	28.6	10	71.4
C33-C34	Lung	77	9.5	9	11.7	16	20.8	52	67.5
C43	Malign. melanoma	36	4.4	14	38.9	3	8.3	19	52.8
C44	Skin others	230	28.4	31	13.5	16	7.0	183	79.6
C46,C49	Soft tissue	14	1.7	5	35.7	1	7.1	8	57.1
C61	Prostate	128	15.8	60	46.9	14	10.9	54	42.2
C64	Kidney	18	2.2	9	50.0	2	11.1	7	38.9
C67	Bladder	28	3.5	9	32.1	4	14.3	15	53.6
C70-C72	CNS cancer	9	1.1			1	11.1	8	88.9
C76-C79	CUP	9	1.1			1	11.1	8	88.9
C81	Hodgkin lymphoma	13	1.6	4	30.8	2	15.4	7	53.8
C82-C85	NHL	38	4.7			5	13.2	33	86.8
C91-C96	Leukaemia	18	2.2			1	5.6	17	94.4
Others, specified		67	8.3	21	31.3	13	19.4	33	49.3
All further malignancies		809	100.0	195	24.1	98	12.1	516	63.8

Further malignancies with number of cases 1 to 8 are pooled in category “Others, specified”.

ICD-10 C44 (Other malignant neoplasms of skin) is not systematically recorded by MCR and therefore not considered for evaluation as a particular primary but at least as a further malignancy.

Table 14b

Further malignancies in deaths in period 1998-2016
FEMALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C16	Stomach	8	2.4	1	12.5	4	50.0	3	37.5
C18	Colon	23	6.9	10	43.5	2	8.7	11	47.8
C19-C20	Rectum	9	2.7	5	55.6	1	11.1	3	33.3
C25	Pancreas	8	2.4					8	100.0
C33-C34	Lung	22	6.6			3	13.6	19	86.4
C43	Malign. melanoma	12	3.6	6	50.0			6	50.0
C44	Skin others	73	21.8	23	31.5	4	5.5	46	63.0
C50	Breast	67	20.0	38	56.7	9	13.4	20	29.9
C53	Cervix uteri	5	1.5	5	100.0				
C54	Corpus uteri	10	3.0	5	50.0	2	20.0	3	30.0
C56	Ovary	10	3.0	3	30.0	2	20.0	5	50.0
C64	Kidney	11	3.3	2	18.2	3	27.3	6	54.5
C67	Bladder	4	1.2	3	75.0	1	25.0		
C70-C72	CNS cancer	11	3.3	2	18.2	3	27.3	6	54.5
C73	Thyroid	4	1.2	3	75.0			1	25.0
C76-C79	CUP	4	1.2	1	25.0			3	75.0
C82-C85	NHL	22	6.6			1	4.5	21	95.5
Others, specified		32	9.6	12	37.5	4	12.5	16	50.0
All further malignancies		335	100.0	119	35.5	39	11.6	177	52.8

Further malignancies with number of cases 1 to 3 are pooled in category “Others, specified”.

ICD-10 C44 (Other malignant neoplasms of skin) is not systematically recorded by MCR and therefore not considered for evaluation as a particular primary but at least as a further malignancy.

Table 15

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2016
(**First primaries only** *)

Age at death Years	Males n	Females n	Males Age-spec. mortal.	Males MI-index	Females Age-spec. mortal.	Females MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4		3			0.3	0.08		20.0
5- 9	5	3	0.5	0.16	0.3	0.10	21.7	16.7
10-14	2	8	0.2	0.10	0.7	0.47	8.7	38.1
15-19	5	2	0.4	0.23	0.2	0.15	11.9	10.0
20-24	5	3	0.4	0.38	0.2	0.38	9.8	9.7
25-29	5	1	0.3	0.63	0.1	0.10	7.5	1.5
30-34	7	4	0.4	0.54	0.3	0.44	6.9	3.8
35-39	5	5	0.3	0.29	0.3	0.50	2.6	1.9
40-44	9	4	0.5	0.35	0.2	0.20	2.0	0.7
45-49	6	9	0.3	0.13	0.5	0.64	0.6	0.8
50-54	14	8	0.8	0.19	0.5	0.33	0.8	0.5
55-59	28	10	2.0	0.34	0.7	0.23	1.0	0.4
60-64	37	23	3.0	0.47	1.7	0.40	0.9	0.8
65-69	66	28	5.6	0.45	2.2	0.36	1.1	0.7
70-74	113	60	10.2	0.68	4.7	0.67	1.6	1.1
75-79	137	58	17.2	1.04	5.8	0.73	2.1	1.1
80-84	124	87	27.0	1.02	12.3	0.90	2.3	1.6
85+	89	112	29.1	0.86	15.3	0.59	1.9	1.5
All ages	657	428					1.6	1.2
Mortality								
Raw			2.9	0.57	1.8	0.52		
WS			1.3	0.38	0.7	0.33		
ES			2.0	0.48	1.0	0.40		
BRD-S			2.8	0.58	1.3	0.48		
PYLL-70								
per 100,000			14.8		11.4			
ES			14.8		12.7			
AYLL-70			15.4		20.5			

* See corresponding tables with multiple malignancies.

Table 16

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2016
(**Single primaries only** *)

Age at death Years	Males n	Females n	Males Age-spec. mortal.	MI-index	Females Age-spec. mortal.	MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4		3			0.3	0.08		20.0
5- 9	5	3	0.5	0.16	0.3	0.10	21.7	16.7
10-14	2	7	0.2	0.10	0.6	0.41	8.7	33.3
15-19	5	2	0.4	0.24	0.2	0.15	11.9	10.5
20-24	4	3	0.3	0.31	0.2	0.38	7.8	9.7
25-29	3	1	0.2	0.38	0.1	0.10	4.5	1.5
30-34	7	4	0.4	0.54	0.3	0.44	6.9	3.8
35-39	4	5	0.2	0.25	0.3	0.50	2.1	2.0
40-44	8	4	0.4	0.32	0.2	0.20	1.8	0.7
45-49	4	7	0.2	0.09	0.4	0.58	0.4	0.6
50-54	12	6	0.7	0.17	0.4	0.33	0.7	0.4
55-59	20	9	1.4	0.26	0.6	0.25	0.7	0.4
60-64	18	15	1.5	0.27	1.1	0.32	0.4	0.5
65-69	39	22	3.3	0.34	1.7	0.35	0.7	0.5
70-74	69	45	6.2	0.62	3.6	0.58	1.0	0.9
75-79	81	39	10.2	0.75	3.9	0.61	1.3	0.7
80-84	81	69	17.6	0.79	9.8	0.75	1.6	1.3
85+	65	92	21.2	0.66	12.5	0.51	1.5	1.3
All ages	427	336					1.1	0.9
Mortality								
Raw			1.9	0.43	1.4	0.45		
WS			0.9	0.28	0.6	0.29		
ES			1.3	0.36	0.8	0.36		
BRD-S			1.8	0.43	1.0	0.42		
PYLL-70								
per 100,000			11.9		10.3			
ES			12.2		11.6			
AYLL-70			18.3		22.5			

* See corresponding tables with multiple malignancies.

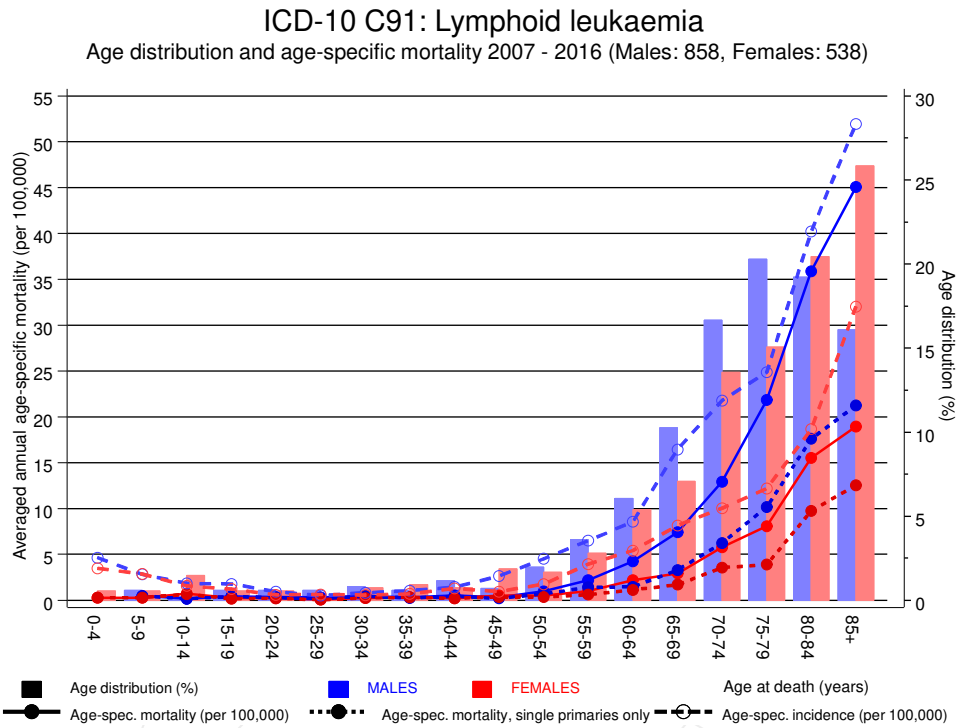
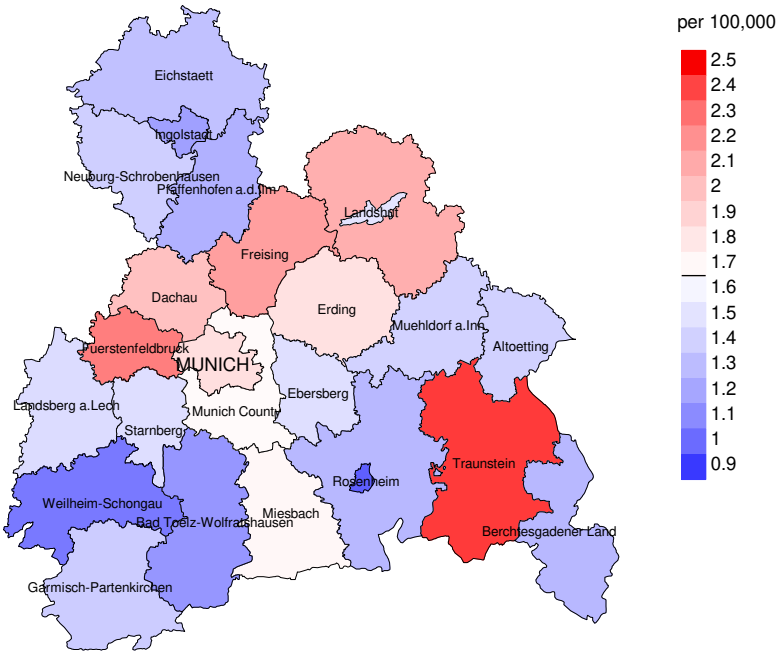


Figure 17. Distribution of age at death (bars; males: mean=67.1 yrs, median=69.1 yrs; females: mean=69.0 yrs, median=72.4 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

The difference between age at diagnosis (Table 3) and age at lymphoid leukaemia-related death (see Table 10) should be considered.

Average mortality (world standard population) 2007 - 2016: Males



Average mortality (world standard population) 2007 - 2016: Females

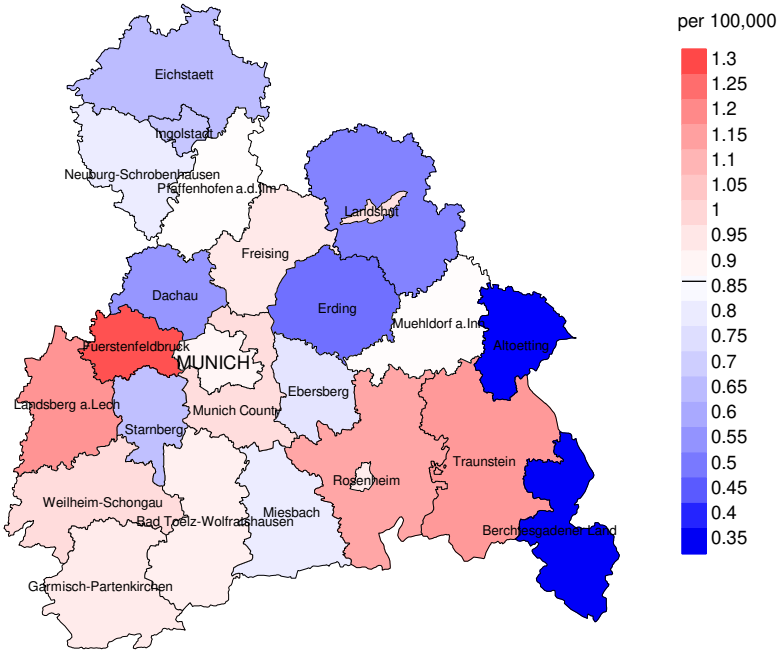
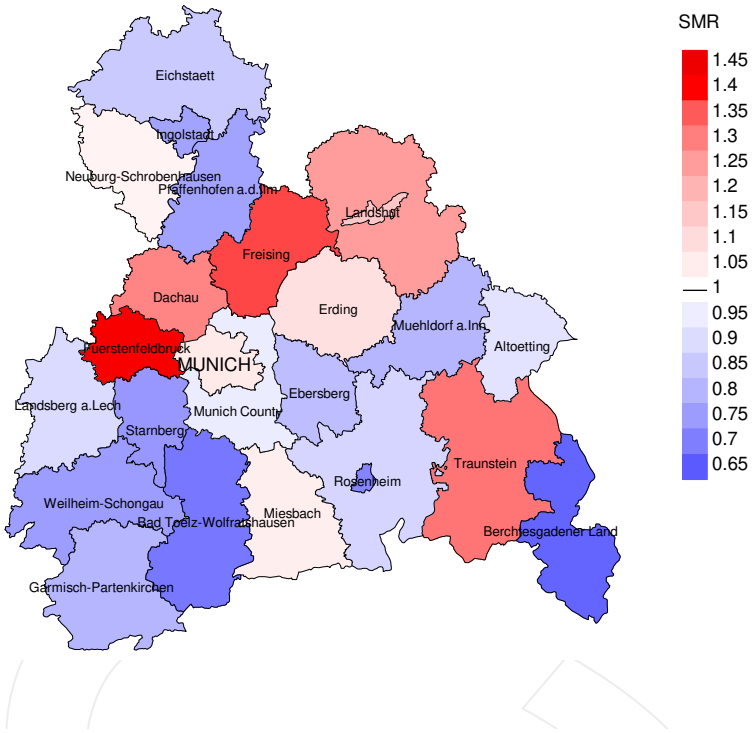


Figure 18a. Map of cancer mortality (world standard population) by county averaged for period 2007 to 2016. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 1.7/100,000 WS N=858, females 0.9/100,000 WS N=538).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 18 women died from lymphoid leukaemia. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 0.8/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.3 and 1.9/100,000.

Standardized mortality ratio (SMR) 2007 - 2016: Males



Standardized mortality ratio (SMR) 2007 - 2016: Females

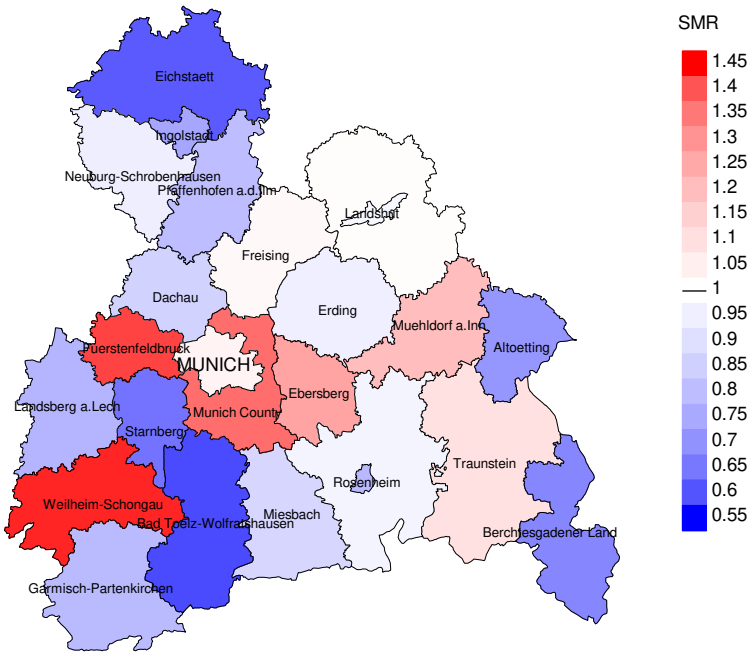


Figure 18b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=858, females N=538).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 18 women died from lymphoid leukaemia. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 1.26. Though, the value of this parameter may vary with an underlying probability of 99% between 0.63 and 2.25, and is therefore not statistically striking.

Statistical Notes

In all tables and figures the respective reference values should be carefully considered. The incidence rates include diagnoses (with multiple primary), and death certificate only (DCO) cases, where applicable. For mortality statistics patients, diagnoses and progressive course of disease are presented. In the calculations, all courses of disease are considered whereby progressions occurred and/or death certificate identified progressive cancers were ascertained. Additionally there are three groups of disease course to consider:

1. **All multiple primaries included**

   The mortality statistic describes the tumor-specific death, independent of any malignancy. The patient perspective, induced secondary malignancies, and the problem of multiple malignancies from the same primary tumor all have reasons for their inclusion.

2. **First singular primary** (no information about other prior or synchronous malignancy)

   The mortality statistic describes the cancer-related death for patients who have no therapeutic restrictions due to a previous or synchronous cancer. These statistics are comparable to studies that have exclusion criteria based on a second malignancy.

3. **Single primary** (no information about other prior, syn- or metachronous malignancy)

   The mortality statistic describes the tumor-specific death that occurs without any impact through secondary primaries, earlier, synchronous, later or induced. Precisely the difference between disease group 1 and 2 highlight the magnitude of the problem of secondary malignancies.

For this reason differences appear concerning official mono-causal mortality statistics. To judge the maximum deviation, 2 further tables are presented. In the first table the distribution of secondary malignancies before, at or after the described cancer are shown, that could be an alternative cause of death. In the second table, the age-specific mortality rates for all courses of disease, without designation of secondary malignancies are shown.

A previously minimally acknowledged statistic is the **age at death**, which allows for a good assessment of the quality of classification of the apparent tumor-specific death. For assumed tumor-independent deaths, the age of death should be estimated from the age of diagnosis and the normal life expectancy, whereas tumor-dependent deaths can be estimated from the age of diagnosis plus the average tumor-specific life expectancy. The comparison of different tumors demonstrates this association, if the causes of cancer and the competing cause of death are independent of each other (e.g. breast and colon versus head/neck and lung).

The index from mortality and incidence (Mortality-Incidence ratio, **MI-index**) is a statistic that allows for the evaluation of the quality of data. For diseases with poor prognoses, comparable values are obtained from all age groups, because to a large extent, the numerator and denominator contain the same cases. For tumors with a good prognosis, increasing and decreasing incidence and age-specific differences in prognosis can more strongly alter the MI- index. Additionally, attention should be paid to the confidence intervals where fewer cases are reported.

The complexity of problems identified here emphasizes the importance of relative survival data for the appropriate analysis of long term results.

As a measurement of the burden of disease, the number of potential life years loss due to premature deaths in a cohort can be calculated (**PYLL**, potential years of life lost, standardized per 100,000 persons or per European standard) as well as the average loss of life years per individual (**AYLL**, average years of life lost). Depending upon the analytic aim (health economy, prevention, health care research) different methods exist for the generation of these measurements. In the results presented here, the age for a premature death is considered to be before 70 years, according to the guidelines of the OECD and the WHO (as seen in the abbreviation PYLL-70 or AYLL-70).

Shortcuts

MCR	Munich Cancer Registry (Tumorregister München)
GEKID	Association of Population-based Cancer Registries in Germany (Gesellschaft der epidemiologischen Krebsregister in Deutschland e.V.)
SEER	Surveillance, Epidemiology, and End Results (USA)
DCO	Death certificate only
BRD-S	German standard population
ES	European standard population (old)
WS	World standard population
SIR	Standardized incidence ratio
CI	Confidence interval
EAR	Excess absolute risk = excess cancer cases (O - E) per 10,000 person-years
PYLL-70	Potential years of life lost prior to age 70 given a person dies before that age
AYLL-70	Average years of life lost prior to age 70 given a person dies before that age
SMR	Standardized mortality ratio
MI-index	Ratio between mortality and incidence
FRG	Federal Republic of Germany

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